Qingming Zhang

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Sent: Friday, September 16, 2016 4:18 PM
To: Qingming Zhang
Subject: LOOP EPA Comment Responses on BACT
Attachments: LOOP EPA BACT Responses per Comments.docx

Qingming,

This should be the last of the information needed for draft permit issuance. Please let me know if you come across other items which we can help address as you complete the draft permit.

Thank you.

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Comment: Evaluate CVS as control for the proposed crude oil storage tanks

The VOC BACT evaluation for Floating Roof Tank Landings from the December 2014 application was presented as shown below.

> ***Step 4 – Evaluate Most Effective Controls***
>
> *If a closed vent system and control device is used for emissions control, capital cost, installation, and operation of a flare would be evaluated with the emissions reduced from the proposed EFR tank option. Although the application of a CVS and control device has not been demonstrated for an EFR, we can assume that technically it can be done for the purposes of a cost effectiveness analysis. Based on a quote from the John Zinc Company, an installed combustor having a 98% destruction efficiency has an annualized cost of $471,667. Landing emissions are similar between the existing larger tanks and proposed smaller diameter tanks. The proposed tanks are projected to have one (1) additional landing annually than the existing tanks and therefore, these tanks represent the worst-case condition. Each proposed EFR tank in this project is projected to have landing emissions of 16.10 tpy (5 landings at 6,439 pounds per landing). Applying the 98% control efficiency, the reduction in emissions would equate to 15.78 tpy, thus the CVS plus control device option yields a cost effectiveness of $29,890 per ton controlled. Note that this cost does not take into consideration the engineering and installation of a capture system to route the vapors during a landing event to the control device. Due to the economics, environmental, and energy impacts, and the consideration that the technology has not been demonstrated on an EFR tank, the CVS and control device is considered to be an infeasible control option. Therefore, it is eliminated from further consideration for VOC emission control of the proposed tanks.*
>
> *Limiting the amount of time that the floating roof is landed and complying with 40 CFR 60.112b(a)(2)(iii) is an effective way to minimize the emissions during a roof landing event.*

It has been noted that a CVS has been demonstrated for the control of emissions from storage tanks and that a common control device could be used for all tanks operated. The use of a flare or other means of destruction of VOC emissions for tanks is common in industry. However, for crude oil storage, fixed roof tanks are not common in use and represent a very inefficient way to store product as losses are very high and result in unnecessary secondary emissions. The project proposes the EFR tanks for crude oil

storage and a BACT analysis revealed that it was not cost effective to use IFR tanks. As a result, the project is for the construction of floating roof tanks and not for the construction of fixed roof tanks. Without an enclosure such as a fixed roof tank which can collect and vent vapors to a control device, then the option of a CVS becomes technically infeasible as to enclose an EFR effectively makes the tank a fixed roof tank which is not the project specification. LOOP has years of experience in the practice of operating and maintaining floating roof tanks and does not wish to have multiple scenario tank operating requirements to have to incorporate into standard and emergency planning.

Comment: Evaluate Cost of VOC Control Due to Landings

The changes presented in the June 2016 application include the addition of four 600K BBL storage tanks as well as one 371K BBL storage tank. However, the proposed number of tank roof landings is not being changed. Therefore, the average number of landings and associated emissions per tank is reduced. This results in an increase in cost per ton controlled for each tank as noted in Table 1 below. The result is that control of landing loss emissions remains not cost effective and the initial BACT determination of no additional remains.

Table 1 – Cost Effectiveness Analysis

Tank Size (BBL)	Number of Tanks	Roof Landings Per Tank	Total Roof Landings	VOC Emissions Per Landing (lb)	Uncontrolled Annual VOC Emissions Per Tank (TON)	Control Efficiency (%)	VOC Reduction (TON)	Combustor Cost	Cost Per Ton
December 2014 Application									
600K	15	4	60	6,550	13.1	98	12.84	$471,667	$36,740
371K	6	5	30	6,439	16.10	98	15.78	$471,667	$29,899
June 2016 Application									
600K	19	3.2	60	6,550	10.34	98	10.14	$471,667	$46,537
371K	7	4.3	30	6,439	13.8	98	13.52	$471,667	$34,882